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## Libraries as Special Information Systems

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## LIBRARIES AS SPECIAL INFORMATION SYSTEMS

by

PAUL KAEGBEIN

Libraries can be looked at in various ways. One can regard them as Goethe did: as capital which "noiselessly dispenses incalculable interest" (1). Harnack saw them as "simultaneously storage and workshop and tool of scholarship" (2). The reference to capital on the one hand and to storage on the other makes clear that both Goethe and Harnack viewed libraries as collections of information held over periods of time in a storage unit. This traditional view of the library assumes that information is stored largely in printed form. In recent years there has been much discussion of a different method of storing information, the data bank - a method which may be of help in getting information to its users more quickly and comprehensively.

Libraries and data banks have in common that both need to be supplied with the right materials before they can be drawn upon. The material which must be fed into a library has always been of central interest in the scholarly investigation of libraries: the expansion of library holdings, the processing of library collections, the concern with the contents of the library, often with a strong historical emphasis, constituted the core of this discipline in earlier decades. What were termed "history of the book" and "history of libraries" were seen to be closely related. Only recently have scholars started to regard libraries themselves as social institutions which provide materials for scholarship and teaching, university studies, further education, and general information. The particular types of libraries, their functions and their effectivity, the external and internal conditions under which libraries perform their user-oriented services are starting to be examined.

Thus, library science, though traditionally oriented more towards the past than the present, is shifting its focus of attention - not, of course, without extensive discussion of the areas which overlap and the areas which are distinct from information and communication sciences. Methods taken over from user-analysis are gradually being put to use by libraries in both practical and theoretical ways. The flow of information and communication is being investigated, the interaction between the supply of and demand for information, the use of particular processes of information. Research on methods of exerting influence now interests the librarian, and user-research should lead to an improvement in the organisation of systems of information as well as an improvement in the methods of distributing information. The field of library management is now being investigated: statistical models, for instance, for calculating the number of reading places in university libraries and for estimating the personnel requirements of a research library have been put forward for discussion, and systems-analysis methods have been applied to library structures.

Libraries, then, are objects of scholarly investigation, and they can also make use of such research for their own purposes. The mainly passive function of libraries as centres for the collection of literature has been stressed enough. Modern libraries must do more - they must actively contribute to the process of making information available. The description of an information system put forward by Werner Kunz and Horst Rittel emphasises exactly this active function which libraries, quite as much as other information systems, must demonstrate: "A system is an information system because it contributes to informing, and not because it produces or contains information" (3).

Certainly libraries which focus more of their attention on the efficient conveying of information than libraries have hitherto done will lose none of their present importance; indeed libraries, because of their storage function, have the opportunity of strengthening their position in relation to other institutions which supply information - if they make the right use of information methods.

The jobs which a library performs as a service organisation in the field of information can be divided as follows: providing literature; providing information about literature; and providing information about subjects, facts and dates. This division should make clear that although I use the general term "library", research libraries - university and special libraries - are of particular concern here. However, public libraries are beginning to provide specialised information, so that they too are faced with problems similar to those of research libraries.

Providing literature has traditionally been the main job of every library. Of course the circle of readers interested in a library's collection varies with the type of library: in the universities the users are students and staff; in the state, city and public libraries they are the people who happen to live in that area and who are dependent on these collections; and in special libraries they are researchers and staff members of a particular institution, whose particular demands it is the job of the library to satisfy. The demands of the readers necessarily dictate particular areas of concentration to which the library must give priority in building up its collection. The selection criteria prevailing in a library - according to subject, region, language or level of specialisation - affect the categories which the library offers its users. In addition to publications such as monographs, serials, textbooks, periodicals, dissertations, patent specifications, standards, maps, plans, music, the library offers microcopies in various forms - for instance the microfiche - as well as audio-visual aids, for the operation of which special rooms and special personnel are necessary.

The task of providing literature can only be satisfactorily carried out by a library possessing an adequate collection. Millions of books are lent out by libraries every year; obviously no literature service agency could, either by drawing on the libraries or by building up its own collections, hope to perform this service. On the other hand no library today, no matter how specialised, can possibly hope to have complete collections, nor can it hope to anticipate every wish of its users. Thus in order to satisfy the readers' wishes without exorbitant expenditure, libraries must depend on the co-operation of other libraries. Attempts to organise inter-library loan services among libraries in a particular area or between libraries of a particular type have been in process for decades. Examples of co-operative purchasing schemes are the special subject collections sponsored by the German Research Society, the former Farmington Plan programme and similar schemes developed by Scandinavian libraries. The plan for a comprehensive library system covering all of Germany, known as the Library Plan 1973 (4), envisages co-operation between the various types of libraries in all parts of Germany.

If these schemes are to be successful, libraries must regard themselves as part of a network of libraries, with local, regional and supra-regional levels whose help can be enlisted by other libraries with inadequate resources; more important still, they must be prepared in their day-to-day work to draw upon other libraries to satisfy the needs of their users. The constant increase in inter-library loans and the dramatic increase in demand for copied material underlines the growing dependency of the individual library on other libraries - a dependency which the development of new libraries has done nothing to reduce. The high labour costs for acquiring and cataloguing literature as well as the constant problem of shortage of space will necessarily force those responsible to pay more attention to questions of economic management, to cost calculation and cost benefit analysis. In this connection, the question of the optimal use of literature already owned by the library is relevant. All libraries supported directly or indirectly with public money should be interested in the widest possible use of their holdings. Most libraries may feel satisfied with their performance in this respect, for the number of users steadily increases. However it should not be forgotten that the intensity with which the various parts of the collection are used is quite as important as the absolute increase.

In order to meet the needs of its readers as effectively as possible, the individual libraries should be quite as ready to borrow from other collections as they are to use their own. And as members of a co-operative library system they should do everything in their power to avoid delay in supplying literature needed by other libraries. This means that the necessary space and technical apparatus such as photocopying machines and teleprinters be made available and that the people needed to do the job be on hand. It also means that the library must possess the bibliographical aids essential for the smooth functioning of a system of inter-library lending.

It is the job of the library to provide its users with information about literature as well as the literature itself. Inter-library lending services, for instance, make it necessary that information about existing literature be available to the librarian. But the user too often needs information about literature, and the library must help him to find this information. Here the job of the library is similar to that of a documentation centre, in as far as the latter supplies literature. The relations of these various information-supplying institutions to one another requires further examination.

The kinds of information which a library should make available can be divided into active, passive and intermediary. The most important kind of active information is that about the contents of the library itself. Alphabetical and special subject catalogues - for instance, registers of periodicals, registers of textbooks and of informational aids such as bibliographies - provide this kind of information. The documentation of literature in special areas also belongs to the realm of "active" information: for instance, regional bibliographies based on the holdings of the library, bibliographies covering special areas of collection or research results of a university or firm. SDI services usually also constitute active information. They are oriented to the particular users' profiles and may report on library holdings and the ways in which they are used. An example of such a service normally provided by libraries is the provision of a regular flow of information directed at particular groups or individual users about new books and periodicals.

The library provides passive information by making available informational aids, bibliographies etc (usually placed near the library's catalogues) for the use of



its readers. Intermediary information is a relatively new service provided by the library; it is concerned with transmitting the output of special documentation and information centres. In the case of intermediary information the activities performed by libraries are similar to those of the documentation centres, so that questions of dividing lines and co-operation between these institutions become relevant.

I have referred to the information about its holdings which a library provides, and to the fact that these holdings are less and less able to lay claim to completeness. It follows that the information about holdings is increasingly selective. It is normally no longer possible for a single library to provide a comprehensive coverage of a field, particularly where the field is an extensive one. This is a job which, since the Second World War, has been largely taken on by special documentation centres. These gather together all the literature on a particular subject and quickly distribute information about it to interested parties. Thus the documentation centres are part of a larger domain: on the one hand the original material is required in order that the necessary evaluation can take place; on the other hand the documentary results of such an evaluation would be of little use if the recipient could not at need gain access to the original work.

If one considers the enormous expenditure of time and labour involved in encompassing a particular field, one will understand why a documentation centre is likely to concentrate its not unlimited funds on one goal: on informing its users as quickly and completely as possible, so that they in turn will make constant use of the material provided. Procuring and recording the material which is to be evaluated as well as supplying the users with particular works are very considerable tasks. Libraries, of course, are staffed and equipped to perform these functions; but more important, through years of experience they have developed the necessary methods and know-how to tackle the problems raised by such masses of material.

Probably the best way to satisfy the needs of users in a particular subject area is for a library concentrating on that subject to work together with a documentation centre for the same subject. The library is in any case responsible for collecting the literature; the job of evaluating and providing information is taken over by the documentation centre; and everything connected with using the literature is the concern of the library. The pressure on both institutions is thus lightened in areas which do not constitute their main job. The documentation centre receives the literature which is to be evaluated and does not concern itself with the task of making the original available to the public. The library, which normally merely catalogues independent publications (not, for instance, articles or chapters in books), can do a better job of providing what I have labelled passive information for its users - the bibliographical aids provided by the documentation centre - and can in addition direct users to the special SDI services of these documentation centres.

Libraries should do nothing to disturb direct contact between documentation centres and users wishing to make use of SDI services. Libraries should, however, concern themselves with the organisational and, if necessary, the financial side of these services. They can, for instance, obtain lists of periodicals, conference reports, dissertations etc., so that when demands for this material arise no unnecessary time is lost in supplying them. The librarian must decide whether the library should acquire this material for its own collection or whether a copy or the original should be obtained from another library. Various

possibilities of getting material from other institutions - depending on the kind of literature, the language and the mode of publication - need to be thought about and tried out in advance, so that in case of need the material can be obtained as quickly as possible.

Of course success depends on the co-operation of both sides: library and documentation centre. If the books are to be evaluated quickly, they must be made available for the purpose as soon as they are received by the library. Having the two institutions close together can help to avoid transportation problems. The documentation centre can increase the usefulness of its services by including non-periodical literature such as conference reports and dissertations - literature which at present is rarely evaluated, and which a documentation centre is unable to collect systematically, but which a library collects as a matter of course. Such co-operation can also increase the influence of the documentation centre on library procedures, especially in the area of subject catalogues. A thesaurus consisting of obligatory headings simplifies the job of the librarian responsible for subject cataloguing even in those cases where the librarian is a specialist in the particular subject. Moreover, the necessity of looking for standard terms in a subject catalogue imposes on the user a clear terminology, which he will find helpful in making use of the SDI services.

In cases where the literature on a particular subject has not been evaluated, a library may perform the function of a documentation centre. Where this is so the library should be careful to avoid repeating work that has been undertaken elsewhere and should see that all the results of such documentation are made public, either through its own information services or by contributions to national or international projects.

In the library as a particular kind of information system it should be possible to illuminate the steps which lead the reader to his goal of obtaining information. Normally the reader comes to the library with a particular theme for which he needs literature. To help him find out what literature is relevant to his theme, the library provides him with the relevant bibliographies, abstract journals and reviews, documentation card files, and subject or classified catalogues. From all these sources the user can select the material which is important for him. The subject or classified catalogue provides information about the literature and at the same time gives the location; the other bibliographical aids only provide information about the literature, and the reader must then consult the alphabetical catalogue to see whether the literature he wants can actually be used in the library. This is also the starting-point for those readers who know exactly what works they want. Directions lead them to particular locations within the library - reading-room, open access stacks, special departments or closed stacks. If the literature is not in the library, there are various steps to be followed in order to obtain it elsewhere. The central catalogue of departmental holdings, for instance, makes it possible to locate the work in one or more departmental libraries. If the work wanted is not available at all locally and if the location of the work in another library is known, the other library can be approached directly, if necessary by teletype. The next step would be to request the book via the regional union catalogue and, the final step within this search, via international inter-library loan.

The steps sketched here constitute the core of that discipline which is concerned with the best way to locate and obtain specialised literature. The few university courses which deal with techniques of scholarly investigation spend far too little time on such matters. The result is that students have no systematic training in using bibliographical aids, and that the staff of the

library is burdened with the job of checking inadequate titles and incomplete references. Just as future users of computerised special documentation centres will need to be trained in programming - or at least in the use of a thesaurus - in order to get exact answers to factual questions, so users of special information systems such as libraries need to master the techniques involved in making use of the library. "In an age of specialisation, method is more important than information" (5). The universities in particular, with their often complicated library structures, need to pay far more attention to introducing the reader to the various possibilities of obtaining literature.

I have argued that separate libraries should, in spite of their particular function, feel themselves part of a system. This is especially important for separate libraries belonging to one institution, such as the separate libraries of a university. Much has been said already about the relation between university and departmental libraries. Here I should only like to point out that it is possible to bring different libraries within a university together into a smoothly functioning system without drastically reducing the responsibilities of departmental and special libraries.

Gernot Wersig's general definition of a system also applies to the library system of a university: "A system is a quantity of elements linked in such a way that the quantity as a whole can be marked off from its surroundings" (6). What has been said about libraries in general, particularly in reference to the collecting of literature, also applies to departmental libraries. In all questions which extend beyond the subject and which cannot be answered with available resources, the departmental libraries will continue to depend on the university library. The central library, in turn, not only has the possibility of intensifying its co-operation with the departmental libraries, but can also encourage co-operation between the various departmental and special libraries in order to improve the library resources of the university as a whole.

Although a library system that is clearly structured and readily understood is helpful to the student, it brings with it many problems for the participating libraries. The libraries at the new German universities, however - for instance Constance and Regensburg - show that new forms of organisation can be successfully put into operation. Plans for a library system to serve the new universities in North Rhine-Westphalia (Duisburg, Essen, Paderborn, Siegen and Wuppertal) also adopted a co-operative system. Such developments raise the question whether in the older German universities new forms of co-operation might not also be possible: a sort of decentralised centralisation, in which the central library would perform certain tasks for the other libraries, but where it would also work in co-operation with the departmental libraries to provide services in other parts of the university. In such a system very small libraries should be amalgamated with one another to form economically efficient larger units. Departmental reference collections which are in constant use by staff members should not, however, be affected by such measures.

Plans of the kind I have sketched above have been realised at the Technological University of Berlin (7). In Baden-Württemberg, as well as elsewhere, a general concept for the future growth of the university libraries is being developed. Such co-operative schemes which strive to achieve the greatest possible effect through the development of a functional library system result in an end-product in which the whole is worth more than the sum of its parts.

Structural changes of this kind can be successful only where new forms of organisation are accompanied by measures to raise efficiency - measures extending



beyond library procedures into the realm of general administration. But what are in fact the actual possibilities of transmitting information in libraries more efficiently? A theory formulated by Horst Teichmann in reference to the effectivity of data banks throws some light on this question (8). He sees this effectivity as a function of the previous education of the user; whereas the totally informed expert requires no data from the system, the absolute layman can retrieve no information at all because of his inability to formulate the proper question, so that in these extreme cases the effectivity of the data bank approaches nil. According to Teichmann the optimal value of the data bank is reached at about fifty per cent, that is, somewhere between our theoretically antithetical sets of users or, in other words, where the questioner has an approximately average knowledge both of the field and of the use of data banks. It is worth adding that the largest group of potential data bank users will come from this middle range. In principle this theory could also be applied to library users, for some of whom the spectrum of library catalogues can be likened to a book with seven seals. Until now, however, the theory of cataloguing has been more concerned with the formal and subject-specific criteria of the literature involved than with the special needs of the users for whom the catalogues are intended.

The third of the three previously mentioned areas to which libraries devote themselves is the providing of information about facts and data. Here it is not a matter of furnishing information about literature but rather of furnishing information contained in literature. Furnishing such information is another legitimate task of libraries in so far as they are equipped with the necessary materials. It belongs to the daily routine of the library that a wealth of information is extracted from the reference works available, either with the help of librarians or through the efforts of the user himself. To this third area of operation belongs information extracted from unpublished materials, manuscripts, drafts, architectural drawings, statistics and other such materials - materials which are stored in libraries and require processing.

If we survey the various activities of libraries in the field of providing information, we see that as a rule the conventional methods of direct transmission without the use of technological aids are still used. Indeed, at first glance libraries seem to be hopelessly far behind in applying modern techniques such as data banks to the jobs which they perform. But we should not forget that the book, because it is available in multiple form and can be easily distributed, will continue to be indispensable in many fields. In general, a data bank has the functional limitation of a library catalogue which only exists once: there are technical as well as economic limits to the number of persons who can make use of it simultaneously. In addition, data banks can function only if they have an immense amount of material stored in them and if questions are put to them correctly. These limitations have somewhat dampened the earlier euphoria about data banks; now the possibilities of using such banks on a large scale in the near future are judged more sceptically (9). Recent examples of computer-aided data banks for library purposes show that such projects can become effective only after a relatively long run-in period.

The conclusions to be drawn are clear: there is no substitute for the systematic collection of literature and for professional processing by means of catalogues, bibliographies, reviews and subject documentation card files. These should, however, be supplemented by new media of information retrieval which can, with the help of data banks, quickly provide answers to complex problems. The



possibilities of using the efforts of other institutions in the job of cataloguing (with the help of materials on magnetic tapes) are being extensively worked on (10). Questions of transmitting data over long distances are certainly going to occupy the larger libraries in the immediate future. A project employing the teletype on a large scale to speed up inter-library lending, for instance, has been undertaken by the union catalogue of the state of North Rhine-Westphalia in Cologne.

If libraries are to maintain their present position as special information systems within a network of other information services they will, in growing co-operation with one another and with other institutions, have to make use of new methods of conveying information - methods which, however, will have to be adapted to the requirements of libraries. Libraries must maintain a constant check on their own organisations; they must be ready to adjust themselves to new conditions, to streamline their procedures. All this is necessary if the libraries of the future are to provide efficient information services for their users.

(Translated by Jean Bonheim)

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